

**Case Title: BM10-68**  
**Description: 0.5 mCi Ge/Ga-68 - Shielded**  
**Geometry: 7 - Cylinder Volume - Side Shields**

Source Dimensions		
Height	0.84 cm	0.3 in
Radius	0.13 cm	0.1 in

Dose Points			
	<u>X</u>	<u>Y</u>	<u>Z</u>
# 1	2.18 cm 0.9 in	0.42 cm 0.2 in	0 cm 0.0 in
# 2	6.68 cm 2.6 in	0.42 cm 0.2 in	0 cm 0.0 in
# 3	31.68 cm 1 ft 0.5 in	0.42 cm 0.2 in	0 cm 0.0 in
# 4	101.68 cm 3 ft 4.0 in	0.42 cm 0.2 in	0 cm 0.0 in

Shields			
Shield Name	Dimension	Material	Density
Source	.045 cm <sup>3</sup>	Stycast 1264 A/B	1.1
Shield 1	1.33 cm	Iron	7.86
Transition		Air	0.00122
Air Gap		Air	0.00122
Wall Clad	.22 cm	Iron	7.86
Top Clad	.48 cm	Iron	7.86



**Source Input**  
**Grouping Method : Actual Photon Energies**

Nuclide	curies	becquerels	μCi/cm <sup>3</sup>	Bq/cm <sup>3</sup>
Ga-68	5.0000e-004	1.8500e+007	1.1211e+004	4.1482e+008
Ge-68	5.0000e-004	1.8500e+007	1.1211e+004	4.1482e+008

**Buildup**  
**The material reference is : Shield 1**

**Integration Parameters**

Radial	10
Circumferential	10
Y Direction (axial)	20

**Results - Dose Point # 1 - (2.18,0.42,0) cm**

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm <sup>2</sup> /sec		Exposure Rate mR/hr	
		No Buildup	With Buildup	No Buildup	With Buildup
0.001	1.303e+04	2.241e-301	1.929e-27	6.797e-301	5.853e-27
0.0011	1.243e+05	2.327e-300	2.004e-26	6.482e-300	5.582e-26
0.0086	2.598e+05	3.809e-299	3.280e-25	1.355e-299	1.166e-25
0.0086	5.093e+05	7.489e-299	6.448e-25	2.656e-299	2.287e-25
0.0092	2.422e+06	3.802e-298	3.274e-24	1.263e-298	1.087e-24
0.0093	4.739e+06	7.463e-298	6.426e-24	2.471e-298	2.128e-24
0.0096	1.038e+05	1.691e-299	1.456e-25	5.414e-300	4.662e-26
0.0103	1.010e+06	1.770e-298	1.524e-24	4.943e-299	4.256e-25
0.511	3.290e+07	9.968e+04	2.011e+05	1.956e+02	3.946e+02
1.0145	4.452e+04	3.566e+02	5.742e+02	6.556e-01	1.056e+00
1.0774	6.086e+05	5.292e+03	8.371e+03	9.623e+00	1.522e+01
1.8831	2.636e+04	4.757e+02	6.594e+02	7.495e-01	1.039e+00
TOTALS:	4.276e+07	1.058e+05	2.107e+05	2.067e+02	4.119e+02

**Results - Dose Point # 2 - (6.68,0.42,0) cm**

Energy MeV	Activity photons/sec	Fluence Rate MeV/cm <sup>2</sup> /sec		Exposure Rate mR/hr	
		No Buildup	With Buildup	No Buildup	With Buildup
0.001	1.303e+04	6.495e-302	2.074e-28	1.970e-301	6.292e-28
0.0011	1.243e+05	6.746e-301	2.154e-27	1.879e-300	6.000e-27
0.0086	2.598e+05	1.104e-299	3.526e-26	3.926e-300	1.254e-26
0.0086	5.093e+05	2.171e-299	6.932e-26	7.699e-300	2.459e-26
0.0092	2.422e+06	1.102e-298	3.520e-25	3.661e-299	1.169e-25
0.0093	4.739e+06	2.163e-298	6.908e-25	7.164e-299	2.288e-25
0.0096	1.038e+05	4.902e-300	1.565e-26	1.569e-300	5.012e-27

<u>Energy</u> MeV	<u>Activity</u> photons/sec	<u>Fluence Rate</u> MeV/cm <sup>2</sup> /sec		<u>Exposure Rate</u> mR/hr	
		<u>No Buildup</u>	<u>With Buildup</u>	<u>No Buildup</u>	<u>With Buildup</u>
0.0103	1.010e+06	5.131e-299	1.638e-25	1.433e-299	4.576e-26
0.511	3.290e+07	1.077e+04	2.166e+04	2.114e+01	4.252e+01
1.0145	4.452e+04	3.847e+01	6.182e+01	7.073e-02	1.137e-01
1.0774	6.086e+05	5.709e+02	9.013e+02	1.038e+00	1.639e+00
1.8831	2.636e+04	5.128e+01	7.098e+01	8.078e-02	1.118e-01
TOTALS:	4.276e+07	1.143e+04	2.270e+04	2.233e+01	4.438e+01

**Results - Dose Point # 3 - (31.68,0.42,0) cm**

<u>Energy</u> MeV	<u>Activity</u> photons/sec	<u>Fluence Rate</u> MeV/cm <sup>2</sup> /sec		<u>Exposure Rate</u> mR/hr	
		<u>No Buildup</u>	<u>With Buildup</u>	<u>No Buildup</u>	<u>With Buildup</u>
0.001	1.303e+04	3.934e-303	9.232e-30	1.193e-302	2.800e-29
0.0011	1.243e+05	4.086e-302	9.588e-29	1.138e-301	2.671e-28
0.0086	2.598e+05	6.687e-301	1.569e-27	2.378e-301	5.581e-28
0.0086	5.093e+05	1.315e-300	3.085e-27	4.663e-301	1.094e-27
0.0092	2.422e+06	6.675e-300	1.567e-26	2.217e-300	5.203e-27
0.0093	4.739e+06	1.310e-299	3.075e-26	4.339e-300	1.018e-26
0.0096	1.038e+05	2.969e-301	6.967e-28	9.505e-302	2.231e-28
0.0103	1.010e+06	3.107e-300	7.293e-27	8.678e-301	2.037e-27
0.511	3.290e+07	4.784e+02	9.633e+02	9.388e-01	1.891e+00
1.0145	4.452e+04	1.710e+00	2.750e+00	3.143e-03	5.056e-03
1.0774	6.086e+05	2.537e+01	4.009e+01	4.614e-02	7.290e-02
1.8831	2.636e+04	2.280e+00	3.157e+00	3.592e-03	4.974e-03
TOTALS:	4.276e+07	5.077e+02	1.009e+03	9.917e-01	1.974e+00

**Results - Dose Point # 4 - (101.68,0.42,0) cm**

<u>Energy</u> MeV	<u>Activity</u> photons/sec	<u>Fluence Rate</u> MeV/cm <sup>2</sup> /sec		<u>Exposure Rate</u> mR/hr	
		<u>No Buildup</u>	<u>With Buildup</u>	<u>No Buildup</u>	<u>With Buildup</u>
0.001	1.303e+04	3.409e-304	8.962e-31	1.034e-303	2.719e-30
0.0011	1.243e+05	3.541e-303	9.308e-30	9.862e-303	2.593e-29
0.0086	2.598e+05	5.795e-302	1.523e-28	2.061e-302	5.418e-29
0.0086	5.093e+05	1.139e-301	2.995e-28	4.041e-302	1.062e-28
0.0092	2.422e+06	5.785e-301	1.521e-27	1.921e-301	5.051e-28
0.0093	4.739e+06	1.135e-300	2.985e-27	3.760e-301	9.885e-28
0.0096	1.038e+05	2.573e-302	6.764e-29	8.237e-303	2.165e-29
0.0103	1.010e+06	2.693e-301	7.079e-28	7.520e-302	1.977e-28
0.511	3.290e+07	4.610e+01	9.320e+01	9.047e-02	1.829e-01
1.0145	4.452e+04	1.651e-01	2.663e-01	3.035e-04	4.896e-04
1.0774	6.086e+05	2.450e+00	3.883e+00	4.456e-03	7.060e-03
1.8831	2.636e+04	2.204e-01	3.059e-01	3.473e-04	4.819e-04
TOTALS:	4.276e+07	4.893e+01	9.766e+01	9.558e-02	1.910e-01